WE CLAIM:

1. A method for promoting cell death following exposure to a cytotoxic agent comprising contacting said cell with a modulator of vacuolar proton ATPase activity.

2. The method of claim 1 wherein the cell is a cancer cell.

3. The method of claim 1 wherein the cytotoxic agent is irradiation.

4. The method of claim 1 wherein the cytotoxic agent is a chemotherapeutic agent.

5. The method of claim 1 wherein the modulator of vacuolar proton ATPase activity is an inhibitor of vacuolar proton ATPase activity.

6. The method of claim 5 wherein the inhibitor of vacuolar proton ATPase activity is an macrolide antibiotic.

7. The method of claim 6 wherein the inhibitor of vacuolar proton ATPase activity is bafilomycin A1.

8. The method of claim 6 wherein the inhibitor of vacuolar proton ATPase activity is concanamycin.

9. The method of claim 5 wherein the modulator of vacuolar proton ATPase activity is a benzolactone enamide.

10. The method of claim 9 wherein the modulator is salicilyhalamide A.

11. The method of claim 5 wherein the inhibitor is an inhibitor of vacuolar proton ATPase expression.

12. The method of claim 11 wherein the inhibitor inhibits expression of a vacuolar proton ATPase subunit.

13. A method for promoting cell death following exposure to a cytotoxic agent comprising contacting said cell with an agent capable of inhibiting acidic vesicular function or acidification.

14. The method of claim 13 wherein the cell is a cancer cell.

15. The method of claim 13 wherein the cytotoxic agent is irradiation.

16. The method of claim 13 wherein the cytotoxic agent is a chemotherapeutic agent.

17. The method of claim 13 wherein the agent is an macrolide.

18. The method of claim 17 wherein the agent is bafilomycin A1.

19. The method of claim 17 wherein the agent is concanamycin.

20. The method of claim 13 wherein the agent is a benzolactone enamide.

21. The method of claim 20 wherein the modulator is salicilyhalamide A.

22. A method for identifying a compound that activates V-H^+-ATPase activity comprising (i) contacting a cell expressing V-H^+-ATPase with a test compound and

measuring the level of V-H^+-ATPase activity; (ii) in a separate experiment, contacting a cell expressing V-H^+-ATPase with a vehicle control and measuring the level of V-H^+-ATPase activity where the conditions are essentially the same as in part (i), and then (iii) comparing the level of V-H^+-ATPase activity measured in part (i) with the level of V-H^+-ATPase activity in part (ii), wherein an increased level of V-H^+-ATPase activity in the presence of the test compound indicates that the test compound is a V-H^+-ATPase activator.

23. The method of claim 22 wherein the cell in step (i) and (ii) is exposed to radiation or chemotherapy.

24. The method of claim 22 wherein the ATPase activity is measured by detecting hydrolysis of ATP.

25. The method of claim 22 wherein the ATPase activity is measured by detecting ATP dependent proton translocation.

26. A method for identifying a compound that inhibits V-H^+-ATPase enzyme activity comprising (i)contacting a cell expressing V-H^+-ATPase with a test compound and measuring the level of V-H^+-ATPase activity; (ii) in a separate experiment, contacting a cell expressing V-H^+-ATPase with a vehicle control and measuring the level of V-H^+-ATPase activity, where the conditions are essentially the same as in part (i) and then (iii) comparing the level of V-H^+-ATPase activity measured in part (i) with the level of V-H^+-ATPase activity in part (ii), wherein a decrease level of V-H^+-ATPase activity in the presence of the test compound indicates that the test compound is a V-H^+-ATPase inhibitor.

27. The method of claim 26 wherein the cell in step (i) and (ii) is exposed to radiation or chemotherapy.

28. The method of claim 26 wherein the ATPase activity is measured by detecting hydrolysis of ATP.

29. The method of claim 26 wherein the ATPase activity is measured by detecting ATP dependent proton translocation.

30. A method for identifying a compound that inhibits acidic vesicular organelle acidification comprising (i)contacting a cell with a test compound and measuring the level of acidity in the cell; (ii) in a separate experiment, contacting a cell with a test compound and measuring the level of acidity in the cell, where the conditions are essentially the same as in part (i) and then (iii) comparing the level of acidity measured in part (i) with the level of acidity measured in part (ii), wherein a decrease level of acidity in the presence of the test compound indicates that the test compound is an inhibitor of acidic vesicular organelle acidification.

31. The method of claim 30 wherein the acidity of the cell is measured using an acridine orange assay.

32. The method of claim 30 wherein the acidity of the cell is measured using a DAMP method.